



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,172	08/01/2006	Peter G. Laitenberger	2497A/109	5167
2101 7590 06/18/2010 Sunstein Kann Murphy & Timbers LLP 125 SUMMER STREET BOSTON, MA 02110-1618				
EXAMINER JUNG, UNSU				
ART UNIT 1641		PAPER NUMBER		
MAIL DATE 06/18/2010		DELIVERY MODE PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/588,172

**Applicant(s)**

LAITENBERGER ET AL.

**Examiner**

UNSU JUNG

**Art Unit**

1641

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 and 28-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-06)  
Paper No(s)/Mail Date 3/2/2010
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendments in the reply filed on March 9, 2010 have been acknowledged and entered. The reply included amendments to specification, Fig. 8, and claim 1 and addition of claim 30.

### ***Status of Claims***

2. Claims 1-30 are pending, claims 27 have been withdrawn from consideration, and claims 1-26 and 28-30 are currently under consideration for patentability under 37 CFR 1.104.

### ***Priority***

3. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. The instant application is a national phase under 35 U.S.C. 371 of PCT International Application No. PCT/GB2005/000367, filed on February 3, 2005.

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copies of United Kingdom Patent Application No.'s 0402326.3, filed on February 3, 2004, 0402324.8, filed on February 3, 2004, 0402325.5, filed on March 3, 2004, 0402327.1, filed on February 3, 2004, 0402323.0, filed on February 3, 2004, 0404924.3, filed on March 4, 2004, 0405313.8, filed on March 9,

2004, 0405312.0, filed on March 9, 2004, and 0408535.3, filed on April 16, 2004 have been filed in the instant application.

***Information Disclosure Statement***

4. The information disclosure statement (IDS) submitted on March 2, 2010 has been considered by the examiner.

***Objection Withdrawn***

5. The objection of the drawings has been withdrawn in view of the amended Fig. 8 in the reply filed on March 9, 2010.

6. The objection of the specification has been withdrawn in view of amended specification in the reply filed on March 9, 2010.

***Rejections Withdrawn***

7. The rejection of claims 1, 23, and 25 under 35 U.S.C. 102(b) as being anticipated by Williams et al. (U.S. PG Pub. No. US 2003/0053935 A1, Mar. 20, 2003) has been withdrawn in view of the amended claim 1 in the reply filed on March 9, 2010.

***Claim Objections***

8. Claim 1 is objected to because of the following informalities: the word "and" should be inserted in line 5 following the first occurrence of the word "space."

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 1-12, 14, 16, 17, and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht et al. (U.S. Patent No. 5,900,128, May 4, 1999) (hereinafter "Gumbrecht") in view of Blanco-López et al. (*Trends in Analytical Chemistry*, January 2004, Vol. 23, pp36-48) (hereinafter "Blanco-López").

The prior art reference, Blanco-López, has been cited in the IDS dated August 1, 2006.

Gumbrecht teaches an electrochemical sensor provided on a substrate (see entire document). The sensor includes a confinement structure created from materials applied to the substrate (reference numeral 1 in Fig. 1), wherein the confinement structure comprises at least a first limiting structure defining a first interior space and a transducer (reference numeral 2 in Fig. 1). The electrochemical sensor of Gumbrecht is not prone to cracking or to fluid leakage which can result in a short circuiting or corrosion of sensor (column 1, lines 40-43).

With respect to claim 2, Gumbrecht teaches a sensor, wherein the confinement structure comprises a second limiting structure defining a second interior space, the second interior space containing the first interior space (Fig. 1).

With respect to claim 3, Gumbrecht teaches a sensor, wherein the confinement structure further comprises one or more further limiting structures defining one or more further interior spaces, the one or more further interior spaces each containing an interior space (Fig. 1).

With respect to claim 10, Gumbrecht teaches a sensor, wherein the limiting structures of the confinement structure are annular (Fig. 2).

With respect to claim 11, Gumbrecht teaches a sensor, wherein the sensor further comprises at least one additional confinement structure and a transducer proximal to the first interior space of each of the at least one additional confinement structures (column 1, lines 50-67).

With respect to claims 16 and 17, Gumbrecht teaches the first and second interior spaces contain a conducting material (electrolyte layer, Abstract and Fig. 1).

With respect to claim 20, Gumbrecht teaches that the transducer is disposed on the substrate (Fig. 1).

With respect to claim 21, Gumbrecht teaches that the transducer is an electrochemical transducer (Abstract).

With respect to claim 22, Gumbrecht teaches that the substrate is a silicon wafer and substantially planar (column 3, lines 8-11 and Fig. 1).

With respect to claim 24, Gumbrecht teaches that the confinement structure is fabricated from a polyimide (Abstract).

However, Gumbrecht fails to teach that the electrochemical sensor further comprises a first synthetic polymer capable of selectively binding a first analyte within the confinement structure.

Blanco-López teaches molecular imprinted polymers (MIPs), which are an important class of synthetic materials mimicking molecular recognition by natural receptors (see entire document, particularly Abstract). MIPs have a great range of applications because of the theoretical lack of restriction on size, shape, or chemical character of the imprinted molecule (p36, 1. *Introduction*, 1<sup>st</sup> paragraph). The possibility of tailor-made, highly selective artificial receptors at low cost with good mechanical, thermal, and chemical properties make these synthetic materials appear ideal chemoreceptors (p36, 1. *Introduction*, 1<sup>st</sup> paragraph). For sensing application, MIPs can be immobilized on electrode surface for electrochemical detection (p45, 4.1 *Integration through powder processing*), which reads on the first synthetic polymer being trapped.

With respect to claim 11, Blanco-López teaches that different types of recognition elements can be associated with different sensors (p47, 6.4 *Application to real samples*).

With respect to claims 12 and 14, Blanco-López teaches that the first synthetic polymer is a molecularly imprinted polymer as set forth above.

With respect to claim 25, Blanco-López teaches a method of detecting a target species in a sample comprising contacting a sensor with a sample containing or suspected to contain the target species (p47, 6.4 *Application to real samples*).



Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate MIPs on the electrochemical sensor surface as taught by Blanco-López in the sensor of Gumbrecht in order to detect analytes using tailor-made, highly selective artificial receptors. The advantage of using synthetic receptors that can be tailor-made to be highly selective artificial receptors at low cost with good mechanical, thermal, and chemical properties with no size, shape, or chemical character restriction provides the motivation to combine teachings of Gumbrecht and Blanco-López. One of ordinary skill in the art would have had a reasonable expectation of success in combining teachings of Gumbrecht and Blanco-López since Blanco-López teaches that MIPs can be incorporated into variety of electrochemical sensors.

With respect to the limitation of "the first synthetic polymer is trapped in the confinement structure to prevent peeling of the first synthetic polymer from the substrate", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, Blanco-López teaches molecular imprinted polymers (MIPs), which are an important class of synthetic materials mimicking molecular recognition by natural receptors as set forth in the previous Office action dated December 9, 2009 and above. For sensing application, MIPs can be immobilized on electrode surface for electrochemical detection (p45, 4.1 *Integration through powder processing*). Therefore, MIPs immobilized on the

sensing surface of Gumbrecht would inherently/intrinsically prevent peeling of the first synthetic polymer (MIPs) from the substrate.

With respect to claims 4 and 5, Blanco-López teaches MIPs capable of selectively binding a first analyte is disposed on the sensor surface. Since the sensor is present in the proximity of the first and second interior spaces, which includes electrolyte layer, the MIPs must necessarily be disposed within the first and second interior spaces.

With respect to claims 6-9, Gumbrecht in view of Blanco-López teaches the claimed sensor device except for the internal diameter of the first limiting structure being about 10-350  $\mu\text{m}$ , the height of the first limiting structure being about 1-10  $\mu\text{m}$ , the internal diameter of the second limiting structure being about 50-600  $\mu\text{m}$ , and the height of the second limiting structure is about 1- 100  $\mu\text{m}$ . It would have been an obvious matter of design choice to adjust the dimensions (diameter and height) of the first and second limiting structures, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955) (Claims directed to a lumber package “of appreciable size and weight requiring handling by a lift truck” where held unpatentable over prior art lumber packages which could be lifted by hand because limitations relating to the size of the package were not sufficient to patentably distinguish over the prior art.); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976) (“mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a

claim to an old process so scaled." 531 F.2d at 1053, 189 USPQ at 148.). In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

13. Claims 13, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht (U.S. Patent No. 5,900,128, May 4, 1999) in view of Blanco-López (*Trends in Analytical Chemistry*, January 2004, Vol. 23, pp36-48) as applied to claim 1 above, and further in view of Leyland-Jones (U.S. PG Pub. No. US 2003/0053950 A1, Mar. 20, 2003).

Gumbrecht in view of Blanco-López teaches a sensor and method of detecting target species in a sample using the sensor as set forth above.

With respect to claims 28 and 29, Gumbrecht teaches the first and second interior spaces contain a conducting material (electrolyte layer, Abstract and Fig. 1) and the transducer is an electrochemical transducer (Abstract).

Although Gumbrecht in view of Blanco-López teaches that a variety of analytes can be determined by employing MIPs that can be tailor-made to be highly selective artificial receptors at low cost with good mechanical, thermal, and chemical properties,

Gumbrecht in view of Blanco-López fails to specifically teach MIPs capable of selectively binding propofol.

Leyland-Jones teaches a method of characterizing multi-determinant metabolic phenotype by detecting metabolites of metabolic pathways in a biological sample from individuals in order to provide individualized treatment regime (p13, paragraphs [0137] and [0141]). Enzymes including CYP2E1 are involved in the metabolism of a large number of drugs and as a result have important implications in the outcome of individual drug treatment regimes (paragraph [0177]). CYP2E1 metabolizes several drugs and dietary constituents including isoflurane, halothane, methoxyflurane, enflurane, propofol, thiarnylal, sevoflurane, ethanol, acetone, acetaminophen, nitrosamines, nitrosodimethylamine, and p-nitrophenol (p27, paragraph [0355]).

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to design MIPs of Gumbrecht in view of Blanco-López to specifically detect propofol since Leyland-Jones teaches that propofol is one of the metabolites of CYP2E1 in individuals. The advantage of detecting metabolic pathways in order to provide individualized treatment regimes for patients provides the motivation to combine teachings of Gumbrecht in view of Blanco-López and Leyland-Jones. Further, one of ordinary skill in the art would have had a reasonable expectation of success in combining teachings of Gumbrecht in view of Blanco-López and Leyland-Jones since Blanco-López teaches that MIPs can be tailor-made to be highly selective artificial receptors at low cost with good mechanical, thermal, and chemical properties as set forth above.

14. Claims 15 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht (U.S. Patent No. 5,900,128, May 4, 1999) in view of Blanco-López (*Trends in Analytical Chemistry*, January 2004, Vol. 23, pp36-48) as applied to claim 1 above, and further in view of Ulbricht et al. (U.S. Patent No. 6,670,427 B1, Dec. 30, 2003) (hereinafter "Ulbricht").

Gumbrecht in view of Blanco-López teaches a sensor and method of detecting target species in a sample using the sensor as set forth above. Although Gumbrecht in view of Blanco-López teaches a sensor comprising a first synthetic polymer of a molecularly imprinted polymer, Gumbrecht in view of Blanco-López fails to specifically teach that the sensor comprises at least one additional confinement structure having a reference material therein and the reference material is a corresponding non-imprinted polymer.

Ulbricht teaches a method of using non-imprinted polymer as a reference sample (see entire document, particularly column 11, Example 5).

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to employ a non-imprinted polymer as taught by Ulbricht in the sensor and method of Gumbrecht in view of Blanco-López in order to provide a reference sample. The advantage of having a reference sample (i.e. negative control) provides the motivation to combine teachings of Gumbrecht in view of Blanco-López and Ulbricht with a reasonable expectation of success since such reference data is

necessary to determine specificity of target binding to the first synthetic polymers capable of specifically binding to the target species.

15. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht (U.S. Patent No. 5,900,128, May 4, 1999) in view of Blanco-López (*Trends in Analytical Chemistry*, January 2004, Vol. 23, pp36-48) as applied to claim 1 above, and further in view of Dickert et al. (U.S. Patent No. 6,223,589 B1, May 1, 2001) (hereinafter "Dickert").

Gumbrecht in view of Blanco-López teaches a sensor and method of detecting target species in a sample using the sensor as set forth above. Although Gumbrecht in view of Blanco-López teaches a sensor comprising a first synthetic polymer of a molecularly imprinted polymer, Gumbrecht in view of Blanco-López is silent on teaching that at least one confinement structure further comprises one or more additional substances which provide a specific environment such as a non-aqueous environment.

Dickert teaches that molecular imprinting coatings can be used as both gas and liquid sensors (see entire document, particularly column 2, lines 31-37).

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to use the sensor of Gumbrecht in view of Blanco-López for both gas and liquid sensors as taught by Dickert. The advantage of detecting analytes in both gas and liquid phases provide the motivation to teachings of Gumbrecht in view of Blanco-López and Dickert with a reasonable expectation of success.

16. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht (U.S. Patent No. 5,900,128, May 4, 1999) in view of Blanco-López (*Trends in Analytical Chemistry*, January 2004, Vol. 23, pp36-48) as applied to claims 1 and 25 above, and further in view of Dieffenbach (U.S. Patent No. 5,089,421, Feb. 18, 1992).

Gumbrecht in view of Blanco-López teaches a sensor and method of detecting target species in a sample using the sensor as set forth above. However, Gumbrecht in view of Blanco-López is silent on teaching that the sample is returned to the patient.

Dieffenbach teaches an apparatus of for analyzing blood, which allows collection, analysis, and return of a blood sample of a patient without the sample being exposed to ambient air (see entire document, particularly column 2, lines 4-21). Such apparatus is useful for the continuous monitoring of arterial blood in neonates or adults (column 1, lines 15-17).

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to employ the blood collection apparatus of Dieffenbach in the sensor of Gumbrecht in view of Blanco-López in order to allow continuous blood analysis. The advantage of allowing collection, analysis, and return of a blood sample of a patient without the sample being exposed to ambient air provides the motivation to combine teachings of Gumbrecht in view of Blanco-López and Dieffenbach with a reasonable expectation of success.

***Response to Arguments***

**17. Rejection of claims 1-12, 14, 16, 17, and 20-25 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López**

Applicant's arguments filed on March 9, 2010 have been fully considered but they are not persuasive essentially for the reasons of record and arguments addressed herein.

In response to applicant's argument that the first synthetic polymer is trapped in the confinement structure to prevent peeling of the first synthetic polymer from the substrate is not taught by the prior art, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In response to applicant's argument that the prior art does not teach "the first synthetic polymer is trapped in the confinement structure to prevent peeling of the first synthetic polymer from the substrate", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, Blanco-López teaches molecular imprinted polymers (MIPs), which are an important class of synthetic materials mimicking molecular recognition by natural receptors as set forth in the previous Office action dated December 9, 2009 and above. For sensing application, MIPs can be immobilized on electrode surface for electrochemical detection (p45, 4.1 *Integration through powder processing*). Therefore,



MIPs immobilized on the sensing surface of Gumbrecht would inherently/intrinsically prevent peeling of the first synthetic polymer (MIPs) from the substrate.

Applicant's argument that one skilled in the art would not be aware of how the synthetic polymer could be formed inside the confinement structures is not found persuasive. Further, Applicant's argument regarding MIP deposition techniques disclosed by Blanco-López on Table 5 has been fully considered but is not found persuasive. Although sping-coating, silanization and sandwich techniques may not be suitable for immobilization of MIPs in the confinement structure, Blanco-López further includes another coating method, photografting, which can be used as an immobilization means for coating the substrate of Gumbrecht with the MIPs of Blanco-López.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., fill the whole inner space rather than just covering the transducer area) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In contrast to applicant's assertions; disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. See *In re Susi*, USPQ 423 (CCPA 1971). A known or obvious composition does not become patentable simply because it has been described

as somewhat inferior to some other product for the same use. See *In re Gurley*, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). See MPEP § 2123.

In response to applicant's teaching away arguments, a prior art reference may be considered to teach away when "a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994). General skepticism of those in the art -- not amounting to teaching away -- is also "relevant and persuasive evidence" of nonobviousness. *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F.2d 720, 726, 16 USPQ2d 1923, 1929 (Fed. Cir. 1990). In effect, "teaching away" is a more pointed and probative form of skepticism expressed in the prior art. In any case, the presence of either of these indicia gives insight into the question of obviousness. Blanco-López teaches molecular imprinted polymers (MIPs), which are an important class of synthetic materials mimicking molecular recognition by natural receptors as set forth in the previous Office action dated December 9, 2009 and above. For sensing application, MIPs can be immobilized on electrode surface for electrochemical detection (p45, 4.1 *Integration through powder processing*). Therefore, MIPs immobilized on the sensing surface of Gumbrecht would inherently/intrinsically would prevent peeling of the first synthetic polymer (MIPs) from the substrate. The prior art does not teach that such immobilization techniques would be susceptible to peeling of the MIP's from substrate surfaces.

In view of the foregoing, the rejection of claims 1-12, 14, 16, 17, and 20-25 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López has been maintained.

18. Rejection of claims 13, 28, and 29 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López, and further in view of Leyland-Jones

Applicant's arguments filed on March 9, 2010 have been fully considered but they are not persuasive essentially for the reasons of record and response to arguments set forth above.

In view of the foregoing, the rejection of claims 13, 28, and 29 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López, and further in view of Leyland-Jones has been maintained.

19. Rejection of claim 15 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López, and further in view of Ulbricht

Applicant's arguments filed on March 9, 2010 have been fully considered but they are not persuasive essentially for the reasons of record and response to arguments set forth above.

Further, applicant's argument that Ulbricht does not teach the use of sensor comprised of reference material within additional confinement structure has been fully considered but is not found persuasive essentially for the reasons of record. As set forth in the previous Office action dated December 9, 2009 and above, Gumbrecht teaches a sensor, wherein the sensor further comprises at least one additional

confinement structure and a transducer proximal to the first interior space of each of the at least one additional confinement structures (column 1, lines 50-67) for multi-sensing application. However, Gumbrecht in view of Blanco-López teaches a sensor comprising a first synthetic polymer of a molecularly imprinted polymer, Gumbrecht in view of Blanco-López fails to specifically teach that the sensor comprises at least one additional confinement structure having a reference material therein and the reference material is a corresponding non-imprinted polymer. Ulbricht teaches a method of using non-imprinted polymer as a reference sample (see entire document, particularly column 11, Example 5). Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to employ a non-imprinted polymer as taught by Ulbricht in the sensor and method of Gumbrecht in view of Blanco-López in order to provide a reference sample. The advantage of having a reference sample (i.e. negative control) provides the motivation to combine teachings of Gumbrecht in view of Blanco-López and Ulbricht with a reasonable expectation of success since such reference data is necessary to determine specificity of target binding to the first synthetic polymers capable of specifically binding to the target species. Therefore, the combination of Gumbrecht, Blanco-López, and Ulbricht meets the sensor comprising reference material within additional confinement structure.

In view of the foregoing, the rejection of claim 15 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López, and further in view of Ulbricht has been maintained.

20. Rejection of claims 18 and 19 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López, and further in view of Dickert

Applicant's arguments filed on March 9, 2010 have been fully considered but they are not persuasive essentially for the reasons of record and response to arguments set forth above.

In view of the foregoing, the rejection of claims 18 and 19 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López, and further in view of Dickert has been maintained.

21. Rejection of claim 26 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López, and further in view of Dieffenbach

Applicant's arguments filed on March 9, 2010 have been fully considered but they are not persuasive essentially for the reasons of record and response to arguments set forth above.

In view of the foregoing, the rejection of claim 26 under 35 U.S.C. 103(a) as being unpatentable over Gumbrecht in view of Blanco-López, and further in view of Dieffenbach has been maintained.

22. Since the prior art fulfills all the limitations currently recited in the claims, the invention as currently recited would read upon the prior art.

***Conclusion***

23. No claim is allowed.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to UNSU JUNG whose telephone number is (571)272-8506. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Shibuya can be reached on 571-272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Unsu Jung/  
Unsu Jung  
Primary Examiner  
Art Unit 1641